

Test Procedure for

VERIFYING THE ACCURACY OF WIRE CLOTH SIEVES



TxDOT Designation: Tex-907-K

Effective Date: August 2020

1. SCOPE

- 1.1 This test procedure provides instructions for fine and coarse aggregate sieve inspection and describes methods for:
 - visual check of the physical condition by examining the wire cloth for defects and proper construction—performed at twelve-month intervals, and
 - verification of the wire cloth for dimensional accuracy for all coarse aggregate sieves (No. 4 and larger)—performed at twelve-month intervals.
- 1.2 The district or central laboratory where the sieves are located will perform a verification for dimensional accuracy in accordance with this procedure.
- 1.3 The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

2. REFERENCED DOCUMENTS

- 2.1 ASTM E 11
- 2.2 AASHTO M 92

PART I—VISUAL EXAMINATION

3. APPARATUS

- 3.1 *Evenly lighted background*—to aid in the inspection of the openings.

4. PROCEDURE

- 4.1 Perform a visual check of the general condition of all sieves at twelve-month intervals. Remove from service any sieve not conforming to the following general conditions.

- 4.1.1 The wire cloth should be made of brass, bronze, or stainless steel, but not coated or plated. Hold the sieve towards an evenly lighted background and visually verify there are no punctures, obvious defects, creases, wrinkles, loose wire, or distorted openings that appear damaged or off size compared to others. If more than 30% of the holes appear to be plugged, clean the sieve or remove it from service.
- 4.1.2 The frame must be of seamless construction and made of brass or stainless steel with the wire fastened uniformly to the frame. The sieve must have a joint between the wire cloth and frame filled with solder or other approved filling material for sieves below the No. 4. Perform a visual inspection of the frame to verify that it does not contain cracks or splits that allow material to exit the side of the sieve. Reject the sieve if the frame is cracked. Frames should easily nest with other sieves; dimensions must be in accordance with Table 1.

5. TABLE 1—TYPICAL FRAME DIMENSIONS, MM/IN.

Nominal Diameter ¹ , mm (in.)	Average Diameter, mm (in.)		Typical Frame Height from Top to Wire Cloth ² , mm (in.)
	Frame Inside Diameter (at 5 mm from top)	Frame Outside Diameter	
76.2 mm (3 in.)	76.20–76.76 mm (3.0 – 3.02 in.)	75.24–76.00 mm (2.96 – 2.99 in.)	31.8 mm (1.25 in.)
203.2 mm (8 in.)	203.20–203.76 mm (8.0 – 8.02 in.)	202.24–203.00 mm (7.96 – 7.99 in.)	50.8 mm (2 in.)
304.8 mm (12 in.)	304.80–305.76 mm (12.0 – 12.04 in.)	304.24–305.00 mm (11.98 – 12.01 in.)	82.6 mm (3.25 in.)

1. Other diameters or shapes may be specified by the user.

2. Other heights may be used.

- 5.1.1 The sieve should have a label containing:
- a reference to ASTM E 11 or ASTM specifications,
 - the size (i.e., in millimeters, microns, or inches), and
 - the name of the manufacturer or distributor.

PART II—VERIFICATION OF DIMENSIONAL ACCURACY

6. APPARATUS

- 6.1 *Calibrated dial gauge or calibrated digital calipers*—suitable for 4.75–75.00 mm openings (see Table 2). The design, readability, and precision of the measuring device

must permit accurate measurement of the width of the openings and the diameters of the wires to the nearest 0.01 mm.

7. REPORT FORMS

7.1 Sieve Inspection and Verification Worksheet—as shown in Figure 2.

Note 1—MTD maintains digital calibration/verification equipment worksheet templates. To request a copy, contact MTD at (512) 506-5802.

8. PROCEDURE

8.1 Verify dimensional accuracy on all coarse aggregate sieves (No. 4 and larger) at twelve-month intervals. In addition, the frame dimensions must meet the visual requirements of Part I.

8.2 Measure the width of the openings and the diameters of the wires for both directions of the wire cloth's weave in accordance with ASTM E 11. Keep separate lists of measurements for each direction.

Note 2—One direction of the weave is the warp, and the other is the shute. For the square openings in these sieves, it is only important to keep the measured values for each direction separate.

8.3 Measure the width and wire size of openings in two or more areas of the sieve. Measure at least *ten* openings in each direction in each area. For sieves with *fifteen* or fewer openings, measure all openings.

8.4 Take measurements at or near the midpoint of the openings. Below are examples (Figures 1.1–1.4) from ASTM E 11 illustrating how the measurements are to be performed.

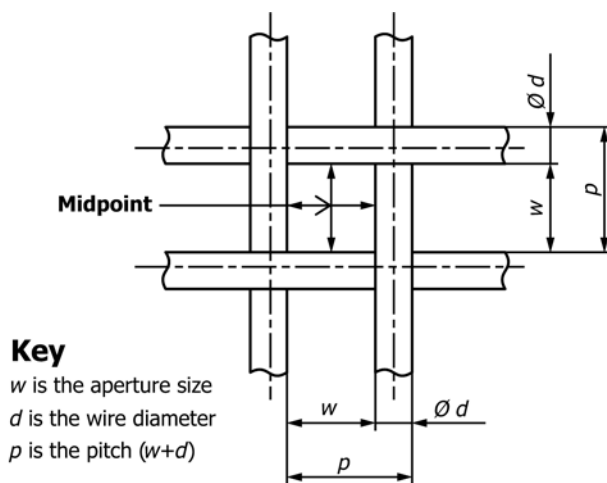


Figure 1.1

Example for Measuring the Midpoint of an Opening

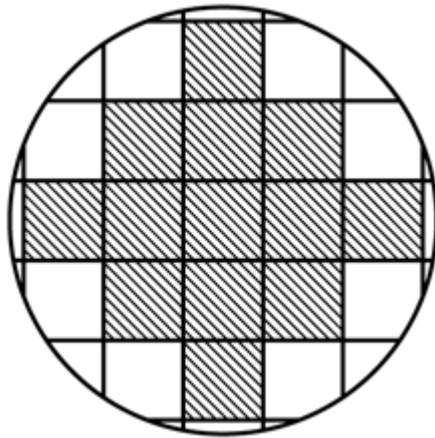


Figure 1.2

For 15 or Fewer Apertures, Measure All Full Apertures

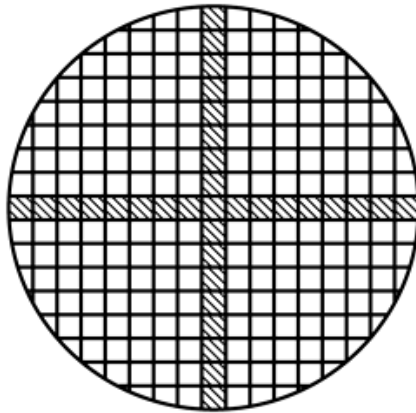


Figure 1.3

Example for Crosswise Spot Check

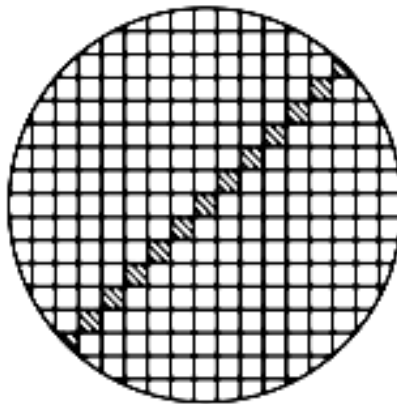


Figure 1.4

Example for Diagonal Spot Check

- 8.5 Average the openings in each direction separately. Reject if either average value does not fall within the range specified in Table 2, as partially illustrated below. For the complete table, please see ASTM E 11.
- 8.6 Count all openings in each direction (by warp and shute separately) whose width falls within the range in Table 2. Count all openings in each direction (by warp and shute separately) whose width falls outside the range in Table 2.
Note 3—A failed warp and shute from the same opening counts as one.
- 8.6.1 Add the two counts for the warp together to get the total number of openings. Divide the number of failed openings by the total number of openings. Multiply this number by 100 to calculate percentage of failure.
- 8.6.2 Add the two counts for the shute together to get the total number of openings. Divide the number of failed openings by the total number of openings. Multiply this number by 100 to calculate percentage of failure.
- 8.6.3 Add together the percentages of failure for the warp and shute. Reject the sieve if the number is greater than 5%. If the sieve has fewer than fifty openings, reject if there are more than three openings outside this range in either direction.
- 8.7 Reject the sieve if any opening is larger than the maximum value in Table 2.
- 8.8 Average the diameters of the wires in each direction separately. Reject the sieve if either average fall outside the range in Table 2.

Table 2, No. 4 and Larger - Nominal Dimensions and Permissible Variations For Sieve Cloth (ASTME11-17)												
DHT (8")	DHT (10")	DHT (12")	Size (in.)	Mesh	Standard (mm)	Opening Min (mm)	Opening Max (mm)	Typical Wire Diameter (mm)	Min	Max	± Y Variation (Min) Ave Opening (mm)	+ X Maximum Variation Opening (mm)
			5	5.00				8.00	6.8	9.2	3.300	4.060
			4.24	4.24				6.30	5.4	7.2	2.960	3.740
			4	4.00				6.30	5.4	7.2	2.650	3.440
			3½	3.50				6.30	5.4	7.2	2.390	3.180
			3	3.00	75.00	73.00	77.78	6.30	5.4	7.2	2.000	2.780
		2158	2½	2.50	63.00	61.31	65.44	5.60	4.8	6.4	1.690	2.440
			2.12	2.12				5.00	4.3	5.8	1.420	2.150
2186		2159	2	2.00	50.00	48.66	52.06	5.00	4.3	5.8	1.340	2.060
		2160	1¾	1.75	45.00	43.79	46.91	4.50	3.8	5.2	1.210	1.910
		2161	1½	1.50	37.50	36.49	39.17	4.50	3.8	5.2	1.010	1.670
		2162	1¼	1.25	31.50	30.65	32.97	4.00	3.4	4.6	0.855	1.470
			1.06	1.06				3.55	3.0	4.1	0.722	1.290
2163		2156	1	1.00	25.00	24.32	26.24	3.55	3.0	4.1	0.682	1.240
2164		2155	7/8	0.875	22.40	21.79	23.54	3.55	3.0	4.1	0.613	1.140
2165		2154	3/4	0.750	19.00	18.48	20.01	3.15	2.7	3.6	0.522	1.010
2166		2153	5/8	0.625	16.00	15.56	16.89	3.15	2.7	3.6	0.441	0.890
			0.53	0.530				2.80	2.4	3.2	0.365	0.780
2167		2152	1/2	0.500	12.50	12.15	13.25	2.50	2.1	2.9	0.346	0.750
			7/16	0.438				2.50	2.1	2.9	0.311	0.690
2168		2151	3/8	0.375	9.50	9.24	10.11	2.24	1.9	2.6	0.265	0.610
			5/16	0.312	8.00	7.78	8.54	2.00	1.7	2.3	0.224	0.540
			0.265	0.265				1.80	1.5	2.1	0.189	0.480
2169			1/4	0.250	6.30	6.12	6.76	1.80	1.5	2.1	0.178	0.460
			No. 3½	0.223				1.60	1.3	1.9	0.159	0.420
2170		2149	No. 4	0.187	4.75	4.62	5.12	1.60	1.3	1.9	0.135	0.370

TEX-907-K

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MFG:	
CALIBRATED EQUIPMENT:	
CALIB. AUTHORITY:	
CALIB. TYPE:	
SERIAL NUMBER:	
MODEL NUMBER:	
EQUIPMENT LOCATION:	
SITEMANAGER STATUS:	

CALIBRATION			
DATE:			NEXT DUE:

	FREQUENCY IN MONTHS:		12	
Action Recommended:	None <input checked="" type="radio"/>	Replace <input type="radio"/>	Repair <input type="radio"/>	Other <input type="radio"/>

Status:	Pass
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Frame Condition	
Sieve will nest	
Joint Condition	
Wire Condition	
Screen blinded more than 30%	

Sieve Size (English):		Nominal Diameter (in):	
Warehouse (RSC):		Catalog Number:	
Mesh (mm)	Change Unit ---->	Wire ()	Top Frame
Minimum:	Minimum:	Nominal to + 0.030:	
Nominal:	Nominal:	Bottom Frame	
Maximum:	Maximum:	Nominal to – 0.030:	

[illegible]

Figure 2

Sieve Inspection and Verification

9. ARCHIVED VERSIONS

9.1 Archived versions are available.